

2006 Navy League Sea-Air-Space Exposition

TRANSCRIPT

Event: Professional Seminar: Shipbuilding & the Industrial Base
Date: April 5, 2006
Time: 10am
Panelists: Ms. Allison Stiller, Deputy Assistant of the Navy for Ships
Mr. Michael Toner, Executive Vice President, Marine Systems Group,
General Dynamics Corp.
Mr. Robert Work, Center for Strategic and Budgetary Assessments

Moderator Rick Bernard (Editor of Seapower): Good morning. I'm Rick Bernard, the Editor of *Sea Power*, and I'm very pleased to welcome you this morning to the SAS panel on shipbuilding issues. Before we begin, there's something that we all need to do together, and I'd like to ask each of you to reach into your pockets and your holsters and pull out your cell phones and your Blackberries and so on and turn them off. I need to do that as well. Believe me, I know that you like to stay in touch, but your assistants can handle your offices for the next one hundred and five minutes without you. It can happen. Good. Thank you.

There are a few issues in official Washington that attract more heat and less light than the annual release of the Navy's Plan for new ship construction. Billions of dollars are at stake as the shipbuilding industry struggles with overcapacity and Congress reconciles defense needs with domestic priorities and deficit reduction. Shipbuilding is a volatile issue in part because each year the Navy buys a few ships at very high unit cost. Changing the number of ships in the Plan has a huge affect on every constituency involved including the services, shipyard unions, and our political leadership. Nonetheless, the numbers change frequently along with shifting defense priorities, alterations in total Pentagon spending, and evolving political agendas.

Currently, the Navy is in the midst of a transformation that will bring fundamental change to its structure – that is bringing fundamental change to its structure and its people. Members of Congress remain reluctant to commit future Congresses to long-term courses of action. Shipbuilders, meanwhile, yearn for some stability year-to-year to guide their investments in infrastructure, materials, and skilled labor. This year, things have changed even more, because we have a new Secretary and a new Chief of Naval Operations who want to resolve the national crisis in shipbuilding epitomized by the drop to two hundred and eighty ships recently, the smallest U.S. fleet in several years, and a 2006 budget that funded four ships, a number equaled only once since 1974. They proposed an increase to about three hundred and thirteen ships and the purchase of an average of eleven ships annually through 2015. The Annual Shipbuilding Plan sent to Congress has been chaotic according to Admiral Mullen, our Chief of Naval Operations, due to ever changing numbers, and they need to be stabilized. Admiral Mullen wants to put a tighter reign on design changes, control costs, and encourage the industry to take prudent risks. A key to stability he said is to develop a shared view with Congress, the Pentagon, and industry of shipbuilding goals and how best to achieve them. Secretary Winter said only yesterday at an SAS speech here at SAS that he believes government and industry may be on

divergent paths, which does not bolster the achievement of long-term naval goals. These factors help to explain why the shipbuilding program has become a lightning rod for confrontation and conflict and why we invited an impressive array of experts to be with us today and discuss shipbuilding topics. Their biographies are available in the foyer here, but I am going to give you the highlights of their backgrounds.

Allison Stiller, Deputy Secretary of the Navy for Shipbuilding Programs; she is responsible for executive oversight of all naval shipbuilding programs and is the principal advisor to the Secretary regarding shipbuilding matters. Previously, she was Deputy Program Manager in the Amphibious Warfare Program Office. She has served as the Director for Naval and Commercial Construction in the Office of the Assistant Secretary of the Navy for Ship Programs. She does much of the Navy's testimony on Capitol Hill concerning the shipbuilding program each year. Next is Michael W. Toner, Executive Vice President of General Dynamics Marine Systems Group. He joined Electric Boat in 1965 and has held a wide variety of executive posts in operations, innovations, and other areas of the company. He is responsible for the production and development of a large portion of the Navy's shipbuilding program, and among his many programs includes a joint venture with Northrop Grumman for the production of our attack submarines. Robert Work is an Analyst for the Center for Strategic and Budgetary Assessments. He provides research and analysis on a range of military topics including the challenge of maritime transformation and naval transformation, the El Toro Combat Ship, and the Navy fleet architecture. A frequent contributor to print and broadcast media, Mr. Work is a retired Marine Corp Officer. During his military career, he held a range of command and management positions and was the Marine Advisor to then Secretary of the Navy, Richard Danzig. They are each going to speak in turn beginning with Secretary Stiller, and then, thereafter, we will have questions from the audience. I'm quite sure that we'll have adequate time for many of your questions. Secretary Stiller.

Secretary Allison Stiller: Good morning. Thanks Rick for that kind introduction. I'm honored to be here today to discuss the Navy's Shipbuilding Plan and our industrial base. I'm delighted to share the platform with a longtime industry partner, Mr. Mike Toner, from General Dynamics and a well-respected naval analyst from the Center for Strategic and Budgetary Assessments, Mr. Bob Work. I intend to structure my remarks by briefly reviewing our ship procurement priorities, discussing our recent shipbuilding accomplishments, reviewing the Navy's 2007 Shipbuilding Plan, discussing our shipbuilding industrial base, reviewing initiatives to control ship costs, and highlighting the milestones for the coming year. As recognized in the 2006 Quadrennial Defense Review, the size and capabilities of our force are driven by the challenges we will face. The thirty year Shipbuilding Plan and the resulting ship inventory, as outlined in the Navy's report to Congress, represents our priorities and serves as the baseline reflected in the 2007 budget submission.

Overall, this plan reflects the Navy's commitment to stabilize the demand signal to industry while still achieving the appropriate balance of affordability and capability in all ship classes. Although there is risk in the Plan, we believe the risk is moderate and manageable. Our current plan features a transition period where we are entering serial production on some ship classes and entering the design phase on others. We've completed designs on many new platforms such as LPD 17, Virginia class submarines, TAKE, and Littoral Combat Ship. We are also continuing

to transform our naval fleet with new designs or significant redesigns including DDX, LHA replacement, and CVN 21. CGX, mobile landing platform, and joint high-speed vessel are new designs on the near-term horizon. Currently, there are thirty-eight naval ships under contract in the U.S.; one CVN, thirteen DDGs, one LHD, four LPDs, nine T-AKEs, two LCS, and eight Virginia class submarines. Before I go into specific details about our '07 Shipbuilding Plan, I'd like to highlight some of the accomplishments we've made this last year. We delivered and commissioned LPD 17, the lead ship of the class. We commissioned three DDGs. We laid the keels for the fourth Virginia class submarine, two T-AKEs, two LCS vessels, and three DDGs. We completed the USS Dwight D. Eisenhower CBN 69 refueling complex overhaul and began the overhaul of CBN 70, USS Carl Benson. We were granted milestone via approval from the Defense Acquisition Executive for DDX and LHAR. We exercised the contract option for the ninth T-AKE. We redelivered USS Ohio, SSGN 726, to the fleet and awarded contracts for the third and fourth conversions of SSBNs to SSGNs.

I'd now like to talk a bit about the specifics of the Navy's 2007 Shipbuilding Plan; 2007 will see the Navy's previous R&D efforts translated to detailed design. Transformation is most apparent in this year's budget where new construction quantities have increased to seven ships from the four in the '06 budget. The seven ships include two DDX destroyers, one Virginia class submarine, one Lewis & Clark T-AKE, the LHAR, and two LCS. The first of two increments for procurement of the two lead DDX destroyers is programmed. Split funding of these ships over FY '07 and FY '08 is an alternative financing strategy that the Department has elected to explore with the intent to synchronize the construction of both lead ships in the same fiscal year to allow for future competitive opportunities. This dual lead ship strategy is vital for the Department to meet the congressionally-mandated cost cap for the fifth DDX. The Department has also included the first of two increments for LHA replacement in accordance congressional direction to split fund this vessel. The one Virginia class submarine in the budget provides a steady base to industry as we invest in the producibility improvements that will allow us to achieve two billion dollars per submarine starting in FY '12. The tenth T-AKE will be packaged with the eleventh combat logistics war ship in '08 and three more T-AKEs for the MPFS squadron to allow the Navy and industry to get the best price on the five remaining ships. The acquisition strategy for the two LCSs in the budget is still under development, and the Navy must get approval from OSD on the strategy for these ships. The total number of new ships procured over the is fifty-one, averaging ten ships per year including DDX, LCS, T-AKE, Virginia class SSN, CBN 21, MPFS family of ships, LPD 17, CGX, JHSV, and LHAR. The plan supports CNO Shipbuilding Plan, which calls for three hundred and thirteen ships by 2020.

A stable shipbuilding industry is essential to sustain minimum employment levels and retain critical skills to meet our requirements for an affordable and capable force structure. We must align the industrial base for long-term force development through split funding, advanced procurement, and cost savings initiatives. We must build ships more efficiently, cost effectively, and quickly. To do this, we are committed to help provide stability in the Shipbuilding Plan and rigorously control requirements. Cost and production schedules must be kept within the contractual limits. Industry must be viewed as a trusted partner while we provide a stable baseline on which to plan. To this plan will result in instability that will ripple throughout the entire industry. As we developed our FY '07 Shipbuilding Plan, we were very mindful of our industrial base. This base has sized itself over time to react to the Navy's needs. In 1967, there

were sixteen major shipyards supplying ships and submarines for the U.S. By 1976, we were down to twelve major shipyards, and today, we characterize our industrial bases 'The Big Six,' which has truly morphed into 'The Big Two' with General Dynamics and Northrop Grumman owning these six shipyards. The Littoral Combat Ship has introduced new providers in the Lockheed Martin Team which includes Marinette in Wisconsin and Bollinger in Louisiana and the General Dynamics Ironworks Team, which includes Austal in Alabama. Both Marinette and Bollinger have supplied the Navy and Coast Guard with vessels in the recent past while Austal is relatively new to the U.S. All of The Big Six yards have invested in facilities and process improvements, and the LCS yards are also investing for the future.

These investments must continue so that we produce the best ships at the lowest possible costs for the taxpayer. There is increasing concern within DOD that investment in shipbuilding infrastructure is lagging other corporate sectors such as IT and electronic systems. We must reverse that trend to become more efficient producers which will drive down acquisition costs. I recognize that these shipyards aren't the only players producing naval vessels. As many of you know, half the cost of a surface combatant is tied up in the weapons and communications systems. There is a comparable split between weapons systems for submarines, aircraft carriers, and amphibious ships. We must ensure that corporate investments in these sectors are also being applied to reduce costs to the Navy, and overall, we need to remain mindful of the government program costs and strive for the efficiencies within the Navy as well. The Navy has invested in our shipyards through programs such as the National Shipbuilding Research Program and through contract incentives for facilitization. The Navy's continued investment in our shipbuilders demonstrates our commitment to drive down the costs of our military warships. We continue to be mindful of the cost of ships. Management of the shipbuilding cost growth continues to be a top priority within the Navy. We've undertaken several important initiatives to mitigate future cost growth including budgeting to end up in a cost estimate, using realistic inflation assumptions, and increasing the use of contract incentives.

On current shipbuilding contracts, we've implemented requirements to cause tradeoffs and have reduced contract scope in some cases. We've implemented initiatives with industry including joint change management boards, lean sigma programs, and integrative product teams. Contract incentives have steep share lines combined with performance incentives, multiyear procurement, and use of fixed price contract types have proven to be useful tools. Finally, we can also drive down the cost by streamlining oversight, reviewing technical requirements, and designing the threshold as opposed to objectives. With all this in mind, we will see a number of significant achievements during the coming year, which will help us to attain the CNO's 313 ship Navy in 2020. These upcoming events include approval of the joint high-speed vessel program, return to service of USS Florida, SSG, and 728 this spring; delivery of T-AKE 1 and launch of T-AKE 2 this summer; christening of Hawaii SSN 76; Green Bay LPD 20; and Makin Island LHD 8 this summer; commissioning of USS Texas SSN 775; launch of LCS 1; and christening of George H. W. Bush CBN 77; DDG 100, 102; DDG 103; and T-AKE 3 this fall.

Our mission remains bringing the fight to our enemies and winning the global war on terrorism. The increasing uncertainty of other nations' ability or desire to insure access in a future conflict will continue to drive the need for naval forces and the capability to project decisive joint power from the sea. The increased emphasis on the Littorals and the global nature of the terrorist threat

will demand the ability to strike where and when required, with the maritime domain serving as the key enabler. The Navy is focused on providing more technologically capable platforms to the war fighter. We are investing the necessary R&D resources to provide new capability and are planning for these new classes of ships. We will continue to work with all of our shipbuilding industry partners to capitalize on efficiencies that maximize and result in improved performance. We will develop acquisition strategies that maximize competition at all levels and emphasize cost and scheduled control, and we will continue to strive to modulate within the and stabilize the shipbuilding requirements.

We look forward to the future from the strong partnership between government and industry that has brought the Navy and Marine Corp team many successes. I'd like to thank the Navy League for allowing me to participate in this panel, and I look forward to your questions.

Michael Toner: Good morning. It's certainly an honor and a pleasure to be here to discuss shipbuilding, my favorite subject, with this group. I would never have thought, in 1965, that some years later, probably more years than I care to remember, that I would have the opportunity to talk about shipbuilding to this group. I'm particularly honored that Admiral Donnell is here, and I'm a little bit worried. I'm not sure what I'm going to say here when we get here, but we'll see how it goes. I would appreciate if you – I've got eleven slides to do. It will take a little bit of time, but I think that they will be worthwhile. First slide please.

Mr. Toner: I want to talk about the General Dynamics' group of shipyards. There are three shipyards; Bath Ironworks, Electric Boat, which is constituted by Groton, Connecticut, and Quantum Point, Rhode Island, and NASSCO out in Sand Diego, and what you get out of this picture when you look at it, if you look closely, and this is a little far away so maybe you'll have some difficulty at it, but basically, these yards are small yards, all three of them. In fact, all three yards, if you add it up here, total acreage, would be about a third of a large Korean yard; about three hundred yards versus – three hundred acres versus about a thousand acres on the big international yards. Keep that in mind as we go through this, as you see the investments General Dynamics has made in this infrastructure and what the people are doing associated with building these ships to answer some of the questions that Secretary Stiller has brought forward. Being a little yard, it's a good news story, a bad news story. The good news story is we're small. We're sized for what is called low-rate production, and we are working that on a constant and daily basis, and any impact of work going into this environment has significant impact on the rate or the cost of doing business, because new work is serviced over a small number of people in a small facility. The bad news story is we're small. It's just as equal, and the problem that you have with that in the small yard is that you have a space issue, and we'll talk about that as we talk about some of our work out at NASSCO. We have a space issue at Groton . We have a leased facility there. So, if we had to expand space, it wouldn't be a big deal, and we've contracted that to support the submarine construction program. BIW just added space into it. So, you're small; there's a space issue; and there's a rate issue. If you don't get enough work, a lack of work, or a change of work structure causes significant impact on your rates and drives your cost. Next slide please.

Mr. Toner: At Electric Boat, we consider ourselves the premier building and designer of submarines, nuclear submarines, and I have a slide there that shows three of my favorite

programs; the Virginia, the Jimmy Carter modification, and the transformation of the Ohio class submarine to an SSGN. Let me just talk about those for a few seconds and what that has really meant to us. Basically, the plan was to get to a bridge from where we were in the '90s to the Virginia class submarine, and the plan that we had was that we would go into a significant design bill process where we would conduct a design in an electronic base. In fact, the first ship to be designed totally in an electronic base is the USS Virginia; designed not to Cold War standards but to fight in the 21st Century. An activity that said – in 1992, we established a schedule – in 1994, we established a schedule to deliver the ship, the first ship. We missed it a little bit by a few months. We were supposed to deliver it in the end of June. It delivered in the middle of October, but it was a tremendous effort; a schedule that was ten years old, and we delivered it basically, for all intent and purposes, in good position. At the same time we were in the design process, we had taken a significant challenge to reduce the size of the infrastructure at Electric Boat and start to path the low-rate production.

Significant numbers were taken out of the operations base and the yard itself, as we strung from the high twenties, twenty-eight thousands in the late '80s down to about nine thousand – seven to nine thousand in the late '90s. At the same time, just about 1999, 2000, the 774 design is moving on, and we get an opportunity to go make a modification to the Jimmy Carter, a multi-mission platform. Basically, it was a twenty-five hundred ton section that was going to go into the middle of a ship that was already under construction. Interestingly enough, we were able to apply the lessons that we learned out of Virginia class design, apply them to Jimmy Carter, and basically, from January of 2000, when the Carter complex was not much more than one of those thin view graphs, to November of 2002, about thirty-four months, we delivered down, from point, a twenty-five hundred ton outfitted section to be put into the Jimmy Carter; thirty-four months; an outstanding performance. I don't think any place in the world could have done that. Of course, I'm biased, but it is what it is. At about the same time, we had taken that design philosophy and started looking at the transformation of the Ohio class submarine from a missile-carrying ship – a ballistic missile-carrying ship into a cruise missile ship, and in about thirty-nine months, we transformed that ship, from actual design concept to actual ship. Ohio went to sea, and it was delivered last year in '05.

The second ship, Florida, has been to sea and is in the process of being delivered. So, this entity that we have called Submarine Shipbuilding at Electric Boat – we've reduced, we've structured, and we've positioned it in a format that allows us to go ahead with low-rate production, but there is a volume piece of that discussion, and at the same time, we increased the manning in the early 2000s in order to take on the transformation of SSGN, which we managed at two separate shipyards; one on the East Coast and one on the West Coast. We increased our workforce. As a bridge – as we knew to get the two ships a year, we had planned to take on the idea of an overhaul and repair business that would allow us to transition to that. Times have changed on that. That has gone away. We are going to go work that particular issue as we again restructure our workforce in this timeframe. That is to say between today, as we come off the completion of the SSGNs, to the start of two ships a year. Now, additionally what's happening behind the scenes, which didn't happen the last time, is our design force is being compressed also. Will it do the same thing with them? We will reduce the size of that design force as appropriate to the design capability that we have. We will work very diligently with the customers to see if we can't get enough design work in there to maintain the critical skill level that is necessary to be

around at the time when we design the next summary, and that is actively being supported by our Navy, and we are working those conditions today, but we are going to get smaller. The day of the four thousand man Electric Boat Engineering and Design Team is coming to a close. Next slide please.

Mr. Toner: At Bath Ironworks, we're doing a very similar thought process. The process comes to a robust construction program as we finish out the DDGs, very stable, very understanding. That facility that you see here is a facility that was about, in 2000, started to put in about two hundred fifty plus million dollars put in with help from the State of Maine, the City of Bath, and General Dynamics, an investment made in BIW to improve the way we build ships up in Maine. A piece of the discussion is also lifecycle support and repair of PSA and continuing maintenance of the ship. In each one of these yards, you will see there's an important part of the discussion that's tied to maintenance and repair, and in the cartoon, we have the LCS, and it's a cartoon, because we're just putting it together now, but soon, it's going to be a real aluminum ship, and that's a key word, because aluminum says we've changed the process of ships as to how we are going to build it. It's not a steel ship, and it's being built in a different location but with the talent and ingenuity of the Bath EB National Design and Engineering Team. Of course, we work together totally to try to go and bring the best available engineering and design support to any of the projects that we're doing. Next slide please. Next slide.

Mr. Toner: Out at NASSCO, it's basically a commercial yard that builds naval auxiliaries, and what you see there are three pictures of three ships. These two ships, commercial ships, are Ro/Ro ships; a roll on/roll off ship that was produced for Totem, an Alaskan trade. That ship was electric drive. Oh. By the way, each one of these ships is electric drive, all learning off of the experience that we had by installing electric drive in the TOTE ship. The BP tanker is a double hull tanker. It's a fifty year tanker. Not too many of my friends on the international scene build fifty year tankers, but it's designed to last for fifty years. It's designed for the trade between Alaska and California. We've struggled with those ships. Both of these ships we had difficulty with. We lost money building them, but we finished them. The third ship of the BP class we delivered on time, and the fourth ship, which was last November, the fourth ship of that class and last will be delivered within the contract limits in the later part of this summer. T-AKE, which was the third lead ship that we built and designed from the ground up at NASCO the lead ship, as Allison said earlier, should go to sea in a couple of weeks; April 24th, if it's alright and ready to go. We'll see, but it's very shortly; in a couple of weeks. The second T-AKE will be launched in June. The third T-AKE is on the building ways. Its keel has been laid and is starting to come together, and we started construction on the fourth T-AKE. That process is going and continuing on. As you may have read in the papers recently, based on our experiences in building these commercial ships, we have entered into a relationship with Daewoo, a Korean shipyard, in an effort to provide design, material, and advice on how to build ships a little bit differently to see if we can provide for the Jones Act Trade an equitable ship that will be purchased by the Jones Act community, and we haven't done that yet, but we have got the relationship with Daewoo set down, and then, off in the corner here is this whole thing again; the maintenance and repair piece, which, as a structural piece in a small yard, becomes absolutely critical as we go forward. Next slide please.

Mr. Toner: But what are the keystones? The keys out of building ships are the people, the product, and how this performs. I can't say more about the people. The people are the only reason we can build ships. Without them, it doesn't – I couldn't do anything and would never do anything. The people are what we have. It's our most valuable resource, and it is the resource that we have to do the most with, when we get into the low-rate production. So, you've got to be able to have the idea that people will go to work recognizing that this may be their last day at work and still perform, and I have to tell you, it's not a pleasant experience, but I've seen people that I've worked with for years get into a position where we had to lay them off and go home, and they worked right up until the last minute. It almost brings a tear to my eye when I think of some of the stories that I've heard and participated in for these people. I can't say more about the people that are in the shipbuilding industry; the day-to-day worker that goes to the yard, whatever yard he goes into. American shipbuilders going to work every day are the best resource, the most expansive resource that we have. The products that we build I think are the part that brings the people together. They are unique products. The people get energized for it, and the job of suits like me basically is to get an environment that we can make the people responsive to and energize them. I would submit to you that, at General Dynamics, in my three yards, the people are involved in how they do business, and that's a big deal. I don't know about Northrop. You would have to ask them about it, but my guess is they would do a lot of the same things.

Now, the other side of this equation, the performance, again, is what everybody wants to talk about. You want to make schedules. You want to make costs, and you want to make profit. I'm convinced that if I make profit it's good news for the customer, because the costs are right. If the costs aren't right, I don't make any money. So, I strive to get the cost down, to meet the schedules, to improve my profitability. Do I need to make profit? Yes. I have to make profit. I owe that to my shareholders and to the people that are going to pony up the three hundred million dollars, that are going to go put the money into the ground to go make the modifications necessary, but there's nothing wrong with that. That's America.

Now, what you see here in these three charts is – this one here is really the chart that talks about cost and overhead rates. As small yards like we are, our goal – and you can't really see this, but this is the direct labor and that's the overhead labor, and it's a backwards chart. Admiral Demars used to tell me all the time it didn't make any sense, and he's probably right. He usually was. In this environment, what we're trying to do here is, as the workload falls off, we're trying to bring the rates down, and the uniqueness is to be able to, when the workload gets put back in, keep the rate line almost level. It's got to go up a little bit, because you're going to add more supervisors and let his people come up, but if you can flatten that out, then you generate true rate control, and by generating true rate control, you reduce the cost of an hour's worth of labor, which at the end of the day is all we can really focus on. The shipbuilder part is the hours that are associated with it. We do a lot of stuff with materials. We do a lot of stuff with change, but the big thing is to be able to drive hours out of the ship. This next chart is talking about the investment, and this happens to be BIW, and we're going to talk a little bit more about this in a few seconds. It shows where BIW was in 2000 relative to a study conducted by the Deputy Secretary of Defense for Industrial, Suzanne Patrick, and that study was put out last June, and it shows, in 2000, before we put the land level facility in, Bath was below the average of the American shipyards and significantly below the average of the international yard; the red [sp] barge international yards.

In 2005, the study was done, and it really was done I late 2004, and we're still working on it, but at that particular time, BIW had grown from a yard that was significantly behind the international yards to a yard that was just a little bit above the international yards today. So, while everybody wants to talk about the international yards, what they can do, what they can't do, there's a GD yard that's above it, and we'll see a little bit more as we go on, and the last slide is man hours – whoops. No. Back. This slide here is the man hours coming off the ship. We are down in here right now. This is on BIW ships. This is the first ship out of the land level facility, and we've taken over a million man hours out of the ship, and in fact, the ninety-nine, which we just had movable or just recently last month, is about two hundred thousand hours below the previous ship in its cycle. There's the real goal; keep these numbers coming down. So, you control your costs, make investment, drive your numbers down. The triangle works. Next slide.

Mr. Toner: I talk a little bit about this benchmarking survey that was done last summer, and let's just take a look at what it really tells you about the three small shipyards. The green line is the average of the General Dynamics' yards; that's Bath, Electric Boat, and NASSCO. The yellow line is the average of all of the U.S. shipyards, and the gray line is the average of the international yards, which are made up of European yards and Asian yards, and if you look at this, you can see pretty much where we're at. Don't run right to that one yet. Let me get through there. Steel work; steel work is basically throughput through the facility to your plate yard, things of this nature. We're a little bit higher than what the average yard is, but we're a little bit lower than the international yards. Part of this comes to the fact that the amount of steel that we've put through the yards, with the submarine yards, isn't really a big part of the equation. So, we've got to work this a little bit, and a little bit of it is associated with increasing our performance on our panel lines, but it's a small portion of our business, and we're very close to where the international yards are. These next three bullets, outfit manufacturing, pre-erection, and erection, is how you build the ship. Okay? This is how much outfitting you do before you get into the water, how much you do in the pre-erection, how you move steel to get to make the shapes and forms, and then, you work on the water front. As you can see there, in each of these cases, outfitting was significantly higher than what the international yards had. Pre-erection was significantly higher than the international yards. Erection was significantly higher than the international yards. So, this basically says that – and there is still opportunity. Our opportunity you are going to see, as we talk about the remaining yards, we still have an opportunity to improve this, but we're in this area, in the averages, at world class levels.

The next thing is yard layout, and of course, we're behind; a little bit ahead of the average yard, but this basically comes down to the fact that we are a small yard, and in the commercial arena, you need lay-down space to be able to move your products through your yard. We're impacted at NASSCO by the size of the yard that we have to deal with, and we're going to work that. With some help from the Navy and some creative work ourselves, we are going to try to work that issue, but I'm not sure we are ever going to get that. Little yards are very difficult to be able to match the international yards on that. Engineering and planning is how do you transfer the design from the engineering floor down to the deck plates? That's the key. That's where all the money is. We can make drawers [sp]. We can do a bunch of things, but unless you can translate the design from the deck plates, from the engineering database to the deck plates, it doesn't really matter, and you can see we're a little bit ahead of the U.S. yards, and we're just slightly

ahead of where the international yards are. We have an opportunity here to grow here. I think there is major opportunity here. Organization is how you control your manning, how you put your work – how you use that deck plate work to get the job done, and again, we are a little bit above the average and a little bit above where the international are. For overall, the GD yards are just a skosh ahead. If you went and looked at the data, it's like three point seven two for the international yards; three point seven four for the GD yards. Is that better? I'm not sure it's one-run game or whatever. I don't really know, but I think we're on a par. Next slide please.

Mr. Toner: What are the things that we're doing to enhance performance? What you see here is a section of 776, Section 2B to 5. It's what we call a super module. It's essentially a third of the submarine. This is a new transport system that we have on it. It's capable of taking almost any size module that we can build, up to twenty-five hundred tons and perhaps even more, just by adding on these cards. This is a technology that we learned from the Jimmy Carter experience, and we've applied it and made investments to upgrade our whole transport system using this capability. Additionally, you see the next super module for 777 going into the coding facility to be coded at Point, and that's another investment that we've made since the 2000 timeframe, both on coding and material control, light metal manufacturing, and handling. Our goal, our plan, the idea is to really work this process to take this time out of the schedule, and if the team works together – my opinion is the Navy and EB Team working together can get us to the point where we can deliver 776 on the contract schedule, which is the end of this year, and we are going to try to go work that and make that happen. So, we are reducing cycle time. We're making investments in the facilities, and we are changing how we build the ship. Next slide.

Mr. Toner: At BIW, there's a similar type story. We have a fairly good methodology to build the DDGs, but the real answer in the surface community, from my perspective, is the evolution from picking units to moving units. The land level facility gives us an opportunity to do that, and what you see here is a concept that we are going to do on DDG 106, and we started this past month with the first part of the mega units going in. What we call mega units, it's nice, but basically, it's this section of the ship, and our plan is to build that all as one unit, outfit it, and then bring it out into the construction ways. Basically, we'd like to be able to build big sections of ships. These are the steps to be able to go do that, and this is a precursor to DDX as we look at the how – what is the build strategy that we are going to use to DDX, on DDX, to minimize the costs associated with that, and again, here's that curve that we talked about, building ships for fewer hours, and we're down in here. The plan shows this here. My goal is to see if we can't get this to keep this thing going down. Standard learning curve procedure says that if you build a certain number of modules, a certain number of processes, it's a flat line, and it sort of flattens out and then doesn't go down anymore. I would submit to you that that's true. The first learning coming down is pure learning associated with going from a lead ship to a follow ship and the people getting comfortable with building the ship. I am convinced that the latter part of the curve, this part out here, can still go down, if you work process, and that's where the goal is; to work process improvements to drive cost out of the ships, and we're working that at BIW and at EB and at NASSCO. Next slide please.

Mr. Toner: Out at NASSCO, we are doing a lot of the same type thing. We had a sea lift program, which was basically a Navy amphib program; very successful. It made schedule. It made budget. It did a lot of good things. We're going to get back to that. At the same time, we

are going to build commercial ships in this yard that satisfy the Jones market and then I can produce them for a profit. That's a big, tall order. We're not there yet, but that's where we're going. One of the things that we're going to do in the process is to look at the outfitting cycles that we go at and how we build the ship, and with working with the Navy and with design forces, both at Electric Boat, BIW, and NASSCO, we are going to simplify and reduce and redesign sections of T-AKE for producability. For example, in the electrical on T-AKE, there is four hundred and eighty miles of cable. We brought the EB engineers out to go take a look at how would they do things a little different, and within a very short period of time, we felt we could reduce almost sixty miles of that cable, and that's a difference of just two teams working together. We are looking at splicing cables. We're looking at changing the modules as they come in so that we can build them off hull and put them on the ships as units, very similar to what we've done at and BIW. The plan is – these are the next four. The first four are T-AKEs, and if you look at these lines – and you can't read all this, but the blue line is the very start in the panel line, and this is the amount of outfitting you do. The next line is the erection block, and then, this is, you know, in the ways, and some of them, unfortunately, is only in the water. We're down about twenty-five percent right now. It's working this very hard on the day-after-day-after-day basis to maximize these numbers, minimize that column, and get , because that will improve our outfitting on the deck plates, and then, when we get in the water, minimize the time that we're in the water to reduce the cost. Ships in the water are expensive. The best thing you can do is get them out and get them to sea. Next slide please. This is my final slide. These are the three shipyards. We're run by shipbuilders. That's all we do. We build ships. We respond to the customer. We know how to respond to the customer. Low-rate productions are hard, but we know how to deal with it, and we're going to deal with it, and we're going to drive costs; we're going to drive performance; and we are going to support the people. Thank you for your time and for your patience to listen to the shipbuilder. Thank you.

Mr. Robert Work: Well, good morning. Rick thank you for the introduction. It's really an honor to share the panel this morning with Ms. Stiller and Mike Toner and to be with you today. This is one of my favorite venues, but I have to tell you, when I was rereading my brief last night, I had this flash, this kind of unsettling feeling, and could I have the first slide please? This, generally, was what I kind of felt like. So, before I start, I would like to make a disclaimer. Could I have the next slide?

Mr. Work: Well, as an outside analyst – as an independent naval analyst, one of our jobs is to try to ask questions to the Navy and to try to elicit answers from them from questions they might not like to ask. The thrust of this presentation is going to actually come from a meeting that Mike Toner set up for me. As Rick said, I did a naval fleet platform architecture study about a year ago, and I was designing a fleet to a cost target, and when I did that, I had to make certain assumptions and certain recommendations, and I was invited to come over to General Dynamics, and I came into a room, and I was on an oval table, and I was surrounded by Mike and all of his executives, and we were there for about two hours. We had a great conversation, and it really brought me back to the key thing that I'd like to think about, which is competitive strategies, and that is what this particularly presentation is really going to focus on. Next one.

Mr. Work: Now, if you look through history, the time in history that probably I think is the most applicable to this time is 1815. Britain had defeated revolutionary France and had scoured the

seas. I mean, there was no naval adversary, and they had this huge fleet of large ships; third, second, and first rates, and they were all very manpower intensive, and they had a transnational threat...[end of Tape One, Side One].

At that time, it was very unclear. Could France resurge? Russia might come online across the Atlantic. There was a democratic nation with enormous potential, industrial potential, that really scared them, and they were faced with tight budgets. So, what they decided to do was this. First, they fought the war they were in. They declared war on transnational slavery and bought a lot of small ships to fight that fight. They bought frigates, sloops, and brigs. Then, they adopted what my boss, Andrew, calls a strategy of the second move. Essentially, they had such a powerful fleet that making any new advance which another fleet could copy and then be on an equal footing with the British was not a good move, and the reason why they could do that is because they had this huge commercial industrial base. They had the largest merchant fleet in the world. So, for example, they wouldn't pull the trigger on steamships until the 1840s. There were over a thousand steamships in the British Merchant Marine, but there weren't any in the British Royal Navy, and they were able to do that because of a commercial, and they planned for bold moves to change the rules of the game. They did it in 1860 with the HMS Warrior and then again in 1906 with the HMS Dreadnought and they had a key supporting goal; get rid of manpower costs. So, they got rid of all of their big war ships. Next one.

Mr. Work: So, in '89, we're kind of in the same situation but not quite. We have – how do you sustain our maritime supremacy when there's no naval competitor in sight? We had this large fleet of ships which were extremely capable but manpower intensive. We didn't really have a clear naval threat. We had to really hedge. At that time, there wasn't a real clear naval competitor on the horizon, and our initial answer was, given the uncertainty, focus on presence rather than war fighting. Make sure that you maintain a line of ships so that you would be able to have these ships out there, and it was a holding strategy which really focused on large-surface combatants. If you look back, essentially, it was how to pound targets in the Littorals. Carrier aviation and these VLS combatants were perfect for that mission. You cut the submarine force, because there wasn't a threat to the sea base. You cut your amphibious lift. You got rid of all your small combatants. You got rid of your frigates. You started to deload them. You started to transfer all of your PCs to the Coast Guard. You got rid of your Riverine capabilities, and to get rid of your own end cost, what you did was you civilianized the sea and left the combat logistics force. You pretty much cut your mobile logistics force. You cut the overall size of the force, and you went to an all standard gas turbine fleet. Next one.

Mr. Work: And this is what happened. It was the 1997 QDR. It was at three hundred and two. Now, some analysts say it was a three hundred ship Navy. My figures say three hundred and two. My good friends, Ron O'Rourke and Eric Lapps [sp]; we all have slightly different numbers, but these are pretty close. It was a three hundred and two ship Navy with twenty-six ships that really contributed to the war fight that weren't counted in the ship. Those were ten mine warfare vessels that were in the naval reserve and sixteen enhanced marine pre-positioning ships. Now, this was roundly criticized by everyone. Wow. If you remember, for those of you who followed this game, the following year Admiral Murphy, who was Six Fleet at the time, said, "You really need a four hundred and sixty ship fleet." In 2001, the Navy published a three hundred and sixty ship risk reduction fleet. Then, there was Admiral Clark's three hundred and

seventy-five ship, and the JCSSN study said, “Look, you need somewhere between sixty-six and seventy-six SSNs.” This fleet was roundly criticized. Next one.

Mr. Work: Now, if you think of 2005 though, right now, we’re really where the Brits were in 1815. You have this very large ship. I mean, people don’t realize we have ninety-four percent of the six hundred ship Navy requirement in cruisers – guided cruiser missiles and destroyers. We are tasked with fighting a global war against a transnational threat. Instead of human slavery, of course, it’s radical extremism, and we are really, really starting to get worried about the potential of a maritime competition with China. So, the Navy’s answer is, “Now, you really fight the war you’re in.” You really start to shift to the Littorals. I applaud what the Navy is doing; the Naval Expeditionary Combat Command, the thousand ship Navy, reconstituting Riverine, going after small combatants. This is exactly what the Brits did in 1915, and it’s exactly, in my judgment, what we should be doing now. It’s hard to tell though. The cultural – there are an awful lot of people in the Navy who say that every penny you spend on that you are taking away from the potential maritime competition with China. So, it’s not clear where this will all come out, but we really have adopted a strategy of the first move. As both Ms. Stiller and Mike said, we are shifting out of R&D and making the first move into a large series of combatants. So, we are really starting to prepare, in my mind, for a potential war with a naval peer, and we’re trying to reduce our manpower costs. Next one.

Mr. Work: So, we talked about the three hundred and thirteen ship Navy. It actually has six fewer war fighting ships than the 1997 QDR, which is kind of interesting. We’ve come full circle. Next one. So, where does the industrial-based strategy fit in this? Well, essentially, from me, as an outside viewer, listening to the leaders of the Navy, it’s kind of like a low priority, or it comes across that way. Now, it was first reflected in the 1990s in the submarine design, build, and supplier industrial base. Now, we stopped authorizing submarines for six years, and believe it or not, now, we are going to have a ten-year period where we have two yards building half a submarine per year, and in 2005, this was a statement that former Secretary of the Navy, Gordon England, made which to me is astounding. If you really believe you are on the brink of a maritime competition with a power like China, the last thing you want to do is just say, “Hey. The decision to close yards is a commercial decision.” It is a national decision. It’s very, very surprising for me to hear these types of statements, and during the last year of Admiral Clark’s tenure, it really seemed to me, and you know, I will tell you and you all know, when you give presentations, a lot of times the only thing that is reported is a snippet. So, it was kind of hard to tell, but it really seemed like, over the last year, the industry is the problem. You are causing most of the costs. You really have to drive costs down. Next one.

Mr. Work: So, is that a wise policy, and to me, we cannot rely on a commercial shipbuilding industry like the Brits did in 1850. So, it is absolutely critical that we maintain an industrial and design-based capacity that would allow us to respond to a maritime competition, and moreover, for the first time since Alfred published his work, we are faced with a potential maritime competitor who has an industrial capacity that is either equal to or greater than our own. The Chinese are building the world’s single largest shipyard. They passed us in 2004 in terms of debt weight tonnage. A lot of their merchant ships may have dual military use, and the exhortations for the industry, “Hey. Get your Cold War ship in order,” to me, it’s not ringing quite true yet. So, the two key questions that I ask from a competitor strategy standpoint is, “Hey. Are we

going to have the plans to sustain our competitive edge, if we really get into a gut-busting competition?” Next one.

Mr. Work: So, when you compare the two ships, according to the donned 2007 plan, again, these are two very, very similar fleets; eleven and one carriers, sixty-eight subs versus sixty-eight, a hundred and forty-two surface combatants versus one forty-three. If you look at the numbers, they are almost the same, but this one is extraordinarily more expensive; maybe forty percent more expensive, and we’ve only averaged about eleven billion dollars a year since the end of the Cold War on total shipbuilding. Next one.

Mr. Work: Now, to execute this plan, the Navy is very prudently – and they are extraordinarily open about this. I really, really am impressed with the way the Navy has come out and said, “These are assumptions. We really think they’re valid.” They’re not trying to hide anything. They are being very transparent, but this is what they tell us outside analysts. “R&D must go down and stay down and remain flat.” Now, if you are on the verge of a maritime competition, is that a smart move? No real growth and no one in. Wow. That’s really tough. Rising price of oil; you already have five hundred million dollars in back maintenance in the unfunded deficiency list. No real growth in personnel. The Navy has a terrific plan on this particular assumption, but the outcome is really out of their hands. They already have two hundred and fifty million in unfunded fact of life deficiencies in FY ’07, and at any time, these savings might be diverted to the Army and the Marines, which, as you know, are really having problems. You have to hit the stretch goals, and the Navy calls the targets in their plans stretch goals. You have to hit every single one. There can be no cost increase, and you will fence the shipbuilding. You’ll freeze shipbuilding at a part, and you’ll take – lever will be in your aviation procurement accounts, but wow. If the – aviation probably has as many problems, if not more, than the shipbuilding accounts right now, just based on the huge number of resources that might be coming. Next one.

Mr. Work: Now, these assumptions really have no historical precedent. So, the outside analysts are skeptical. I think I can speak for most of them that they say, “Wow. The chances of these all happening all simultaneously are extremely low.” There is a story of the Apollo program. When we started going to systems analysis and they had to have a reliability factor for the Saturn 5 rocket, they went in to ask Warner Von Brant, “Hey. What’s the probability that this thing is going to work,” and he had four German lieutenants, and he goes, “Is there any reason why the Saturn 5 won’t work?” “Nein.” “Is there any reason?” “Nein. Nein. Nein.” So, the answer was point nine nine nine nine. Now, I’m not sure if that’s a true story, but it sure is a good one. So, let’s just say that you assign a ninety percent probability level that every one of those assumptions is going to be true. You’ve only got a six in ten chance of hitting it, and as soon as you got to eighty-seven percent, it’s a fifty/fifty shot. So, our questions, as outstanding analysts, are: “Are we building an instability into the plan?” Next one.

Mr. Work: So, setting aside the assumptions, the real big cost driver is what’s happening in the surface combatant fleet. Next. Let’s just do some real quick math. It already is going to put enormous pressure on Mike Toner and Northrop Grumman. You were going to build one hundred and sixteen large surface combatants in the big yards. At thirty-five year ESL expected service slides, that meant three point three one ships per year or ten every three years. That

supports two yards in good competition. When you go to eighty-eight because all fifty-five of the LSCs are going to be built in Tier 2 yards, the best you are ever going to get is two point five one per year, and that's ten every four, which if you have two yards, they are going to get an extra ship once every four years, but the high cost of the DDX, and I'm using Navy numbers here, not any outside numbers, we are only going to build thirteen ships between now and 2015. That's a rate of one point four four. That's ten ships every seven years. That includes the CGX, and after that, we stabilize at two. So, you can do some mere calculations for the subs. So, this really explains why the Navy is going after one supplier, because at these rates, it's really tough to maintain the overhead, but it's very clear and it should be very clear to all of us that Congress is very unsettled about the idea of possibly going to just one yard. Next one.

Mr. Work: Now, let's just do some very simple math. Here's the plan in 1997. You can see it. Essentially, I'll boil it down to this. We were going to spend thirty-seven billion dollars on surface combatants between FY '04 and FY '16. That's an average of two point eight four billion a year. Those are the Navy numbers. Next one. The new plan is we are shifting right into the DDX. We built seven extra – excuse me, five extra DDG 51s. We are building fifty-five LCSs. We are going to build six CGXs between now and 2016. So, the price is now sixty-seven billion dollars for these ships between FY '04 and FY '16. That's a five point one three billion average per year, and when you are only averaging eleven billion a year, that's an extraordinary increase; from about twenty-six percent of your resource allocation pie to forty-six percent, and it's going to cost twice as many sailors to man these ships than you had originally planned. Next one. So, this really helps to explain how the plan is structured. You are going to build all of your cheap ships up front. We have fifty-three ships between now and 2011, but you are building sea lift ships, auxiliaries, and LCSs primarily. You are not getting any bump up in the large ships, and then, you stop. You stop building them for seven to ten years. This is the Navy's plan. You rapidly build the fifty-five LCSs, and you stop for thirteen years, and then, you start to build the DDXs and the CGXs, and then, in the 2020s, you simultaneously recapitalize the SSBNs, the LCSs, because there is only a twenty to twenty-five year service life. You are going to have to recock them. You are going to have to rebuild all your amphibs, your large amphibs, the DDGs. Wow. That's really tough. So, you have a rollercoaster. You hit the three hundred and twenty-nine ships in 2019, but then, the bottom really falls out of the plan, and so, essentially, you level off at about two hundred and ninety-three ships; essentially where we are today. Next one.

Mr. Work: So, it's hard for me to figure out how Mike Toner is going to say, "How do I size my workforce? I'm not going to get the two submarines until FY '12, if then," because that depends on them getting eighteen or nineteen billion dollars that year in shipbuilding. No auxiliaries are authorized for that period of time. No immediate ship amphibs, and if we don't build that tenth LPD 17, you've got a ten-year gap. You have no large deck amphib ships in the plan from '13 to '23, and you jump to a rate of two big combatants in 2017. So, how do you retain the industrial base if China really says, "Hey. We have to increase from three hundred and thirteen ships to four hundred and fifty ships?" It's not clear to me that we have the industrial base to just execute this plan. Next one.

Mr. Work: We really have to think about the design. Right now, we're getting out of – we are shifting to production. At the leading end of a competition, that's really risky. All of you know

what happened to the Brits with their astute SSN. Wow. It was a disaster. When they looked back, if GD hadn't gone over and helped them, and it's not clear that they are out of the woods yet, they wouldn't have gotten that ship. They did a path-after-action report, and they said, "Look, you've got to maintain your design teams." So, we have this huge base. We're giving up designers. We're locking in on a surface combatant awful early in the competition. So, the question is, "How do we do this?" Next one.

Mr. Work: Then, you've got to keep your R&D up. You know, you say your R&D is coming down right when you are starting in a competition. Is this going to be our future sea basing operation; boats with TEUs? I hope not, but we really have to figure out whether this thing works or not. It's going to require a lot of R&D. Next one. So, as I look at this, I just say – you know, all you are trying to do, as outside analysts, all every single one – I can tell you, my good friends, Ron and Eric, all of us want the Navy to succeed. We have a lot of questions about the plan. From our perspective, at least from my perspective, I can only talk for me, right now, because of our huge lead, we really I think ought to focus on R&D, focus on prototyping, and focus on building ships that we have come down the cost curve and really know how to build them to save money and change the rules of the game. Could I have the last slide please? Thank you very much, and I look forward to talking to you.

Moderator: All right. Our three panelists have taken us on quite a tour of the shipbuilding industry and shipbuilding issues in a very short amount of time, and we've come to the period in our seminar in which we are ready to take your questions. Those of you with questions, I would like to ask that you use the microphones in the aisle. Would you please, when you ask a question, would you please state your name and the organization that you're from, and you may direct your question at a particular member of the member or to the panel at large; those of you with questions. It's always so difficult to get that first question, isn't it? Let's take the second question. Who has the second question? Yes sir.

Question from Audience: Good morning. My name is Alan . I work at the Naval Surface Warfare Center. I'm sure you all remember Assistant Secretary John Young, a couple of years ago, brokered a deal where I believe the numbers were we transferred four – the construction of four LPDs for four DDGs between Northrop Grumman, General Dynamics, or BIW and . My question is to all panel members. Who do you think was the big winner in that deal? And I'd like Mr. Work to go last actually.

Secretary Stiller: I think the Navy and the industry were the big winners, personally. I think it was the right decision at the time, and I still think it was the right decision, because as you've seen on the curves that Mike Toner showed you at BIW and with the land level facility and the progress they've made on the DDG programs, without those DDGs up there, you wouldn't be seeing – you may not see that level or that trend, and the same goes at Northrop Grumman with the LPDs where they could focus on the learning there. So, I think it was a good – I think it was a win/win for both.

Mr. Toner: Yes. I kind of agree with Allison on that for probably a little bit of different reasons. I mean, you always hate to take volume out of your shipyard, but I think, in the case of the LPDs, we were just bringing on a new facility, and to bring on a new ship at the same time,

having done that out on the West Coast, that's a hard thing to go off and do. Lead ships are extremely difficult to do. Ships that come into a yard that you haven't built before, even though it may have been the third ship down the line, are still lead ships for that yard. It's hard to go off and do. Although, I mean, your tendency is to say, "We'd really like to have the volume," but it allowed us to go put a system in, the land level facility goal work, the process of producing the ship, and drive costs out of the DDG. I think I agree with Allison. It was a win/win for everybody.

Mr. Work: I agree with that also. With the small number of ships that we are building and the different types, when you can really have a yard focus on a particular combatant, you really start to move down these learning curves, and it happened in EB under the Trident program. Mike showed you the numbers for the Virginia and for the DDG, and despite the problems, the very prominent problems that you've heard about; the LPD 17 in the press, I think by LPD 21, Northrop Grumman is getting as far down the line as GD – excuse me, as GD and both Northrop Grumman have been going down the line on the DDGs. So, I think in the end, by the end of this, it really helps focus the workforce, get the learning curve efficiencies that you want, and drive the costs down.

Question from Audience: Good morning. Steve from NASSCO. A question for Allison. Allison, last week you had a, I believe, a maritime force defense acquisition board, and I wondered if you could address for the audience what concerns were reflected by the IPT, OIPT, that they have, and how do you assess the critical steps to get to Milestone B next March?

Secretary Stiller: I actually think – MPFS – the road up to the where there is a series of meetings, OIPTS, IIPTS where we have, at the working level, discussions on a number of issues. We were actually very – actually, there were no large issues presented at all at the . Obviously, like Bob's picture of the sea base of the future, there is a minimal amount of R&D. We really feel like the family of ships option that we came forward with and presented is low risk, because a good portion of the ships that are going to comprise the sea base are already designed or are in design now for the forcible entry fleet, and we feel like that will greatly mitigate the risk associated with the program. So, I view this as a low-risk program. We do have a minimal amount of R&D that we've got invested. I don't see us having any hiccups along the way of getting to Milestone B. One of the things we were able to accomplish, as I mentioned in my remarks, was to talk about packaging the CLF T-AKEs along with the MPFS ones so that as we work with you and work forward with the industry team that we can leverage where we can and show along the run of ships. Of course, we have to get permission for those last three, and that will part of the Milestone B decision, but I think it was a very low-risk discussion. So, overall, I thought it was very good.

Moderator: Mr. Work.

Mr. Work: With all of the things in the Navy Shipbuilding Plan, and I agree with Allison that the ships that we have chosen for the family of ships as we have now is very low risk. In fact, one of the reasons why I think we chose the ships was because they were either designs of grand production or had been produced and the cost targets for those ships were very well understood as well as the performance of the ships, but of all of the things – of all of the components of this

fleet that requires an awful lot of more R&D is the sea basing. The ships are only one piece of a huge system of systems, and the thing that is most striking about the sea basing development, as it has occurred now, is if you compare the inner-war period and the development of carrier aviation, for example, it took us over twenty years to figure out how to operate aircraft off of the deck of a carrier; what size the carrier should be, what capacities it should have, what type of pulse and streams with the type of aircraft on board, how to integrate it into the battle line and into fleet operations. We haven't done any of that for the sea basing. So, I think that we are very safe in continuing to produce like extra T-AKEs, because we will always be able to use them; extra LMSRs. We will always be able to use them, but we have a lot of work to go before we can see whether or not that is an operational capability that will provide value to the fleet.

Audience member Steve: Can I respond? I actually think it's lower risk – it's considerably lower risk than what Bob thinks. How we went about, on MPFS, and I understand that he's talking sea basing in a broader sense, and the connector piece will come, but as we define the MPFS squadron, we assumed we were using connectors that we have today. So, you have your envelope, and as we design connectors of the future, they are going to have to fit in that envelope, and I think that's the way we ought to approach this; as this is the envelope that the current capability or these ships will provide and then you set the conditions for the connectors in the future.

Moderator: More questions? All right. There are people in the audience that do not understand the relationship between the audience and the panel. The members of the panel have done their job, and the task before you is to make them as uncomfortable as you possibly can. If there are no questions, it doesn't mean that you get to go to lunch. It means that I'm going to have the doors locked. Yes sir. Over here. Let's go over here first.

Question from Audience: Ed Anderson, PEOW Advanced Technology. DARPA has a project to build titanium for five dollars a pound in powder form. How are you going to go about investing in ways to turn it into improving our ship force?

Moderator: Can you say that again?

Audience member repeats: DARPA has a project called Titanium for Five Pounds in the form of powder, and you need to invest in – the Navy needs to invest in processes that turn it into product. What is your strategy to figure out how to use that outcome from DARPA in our favor for the Navy in shipbuilding?

Secretary Stiller: Am I supposed to answer that?

Audience member-Ed: Yes.

Secretary Stiller: Okay. Well, any of the unique materials that you use is going to be dependent on how you are going to use them, where you are going to want to use them for the ship. I mean, our ships today have a little bit of titanium in them, not a whole lot. Titanium itself brings with it a whole list of problems that you have to go off and solve, as you are well aware of. Do you have a process that develops a powder into a metallurgical component, and that component needs

to be used to produce the ship, and it has a requirement that drives the – if the ship has a need for that requirement, we'll figure a way to go off and make it. I don't know of any right now. It's the first I've ever heard of it.

Audience member-Ed: And I'll just make one comment. That's one of Dr. Header's [sp], my boss, as an RDA's goal, is how do we transition from the S&T world into the shipbuilding and the aircraft procurement side of the house, and that's one of the challenges that she has presented to the Office of Naval Research and others to go and figure out how to bridge that divide, and so, it is a real problem, and we're working it .

I think, in reality, as it goes back into the submarine community, there are portions at Electric Boat that have the capability to go and look at new technologies as they come forth and as they come from the design conceptual phase and have, as in the concept formulations, the requirement to be able to say, "How do we take that technology to sea?" So, I guess it's a multi-step process. You have an alloy or a material that's capable of being used. It provides a need in the ship for something. If it was in the submarine side of the world, the conforming group at EB would go look at it and figure out a way to go put it onto the ship, if in fact it was needed on the ship, but just to say titanium for titanium because it sounds neat probably doesn't ring the bell.

Moderator: Over here. Yes sir.

Question from Audience: It sounds like virtual modeling is being used a lot in designing everything from the auto industry, and you mentioned the Virginia class was using something like virtual simulation. What about a virtual shipyard? Is there anything going on in a virtual shipyard that would be for the Navy that would also tie into the production lines in the shipyards, and if so, since it sounds like these ship classes are pretty predefined already on existing work, how are you going to address when new threats come up and you need new designs?

Mr. Toner: Well, in the case of Virginia, we basically built that ship numbers upon numbers of times in the 3-D model and using the model down to the point where we have the individual from the shipyard, the production floor, come up and do their work package and look at their specific bulk head or whatever piece they happen to be building to satisfy ourselves that the generation of the work paper that was going down to the deck place was something that they could use and that the changes that they would see heretofore would have been a mistake, that was in steel, would only be in the ones and zeros point, and we were able to go take a lot of the change and impact of the change out of the construction process. Now, the question is whether you can put a virtual shipyard in, and I think there are people that do that. Again, our yards are small. So, what we used was equated to our yard. It would be a big benefit, if you're going to build a brand new yard and you wanted to start up and decide how to do it, you could certainly take your models, any of your models that are in the electronic medium, and decide how that shipyard is going to be worked.

[Inaudible question].

Moderator: What?

[Inaudible question].

Moderator: Stand up and talk in the microphone so I can hear you. My ears are just about shot.

Question from Audience: Let me clarify. What happens is the Navy has a virtual shipyard. It can also go down to the Navy builders and as well as commercial builders too.

We don't build ships in our public yards anymore. I think where we are going on design tools, for example, I'll use DDX, which is also being designed using the tools similar to Virginia. You are going to have two yards involved in design and two yards involved in production. So, there is an environment that they work in now that will translate those digits into production drawings and into the actual production of the ships. Your question on the threat; I just wanted to make sure that I'm clear that DDX, CBN 21, all the ships that are in design are designed to counter future threats, and obviously, they'll deal with today's threats, but they are also being designed with an eye towards the future out in the 2020 timeframe. So – and yes, with the tools that you have on DDX and CBN 21, the design tools, you have a little bit more agility in refining design, if you feel that you need to do that further down in the life of the ship or the life of the number of ships. So, if you went to a flight, for example, on a run of ships, you do have that capability.

Moderator: We'll go to the other side. Please remember to give us your name and organization.

Question from Audience: Yes. I'm Bill Wyatt, and I'm retired Navy, and I don't work for anybody, just myself. To talk about cost a little bit, I think when we come to a symposium like this we focus on the shipyard, when we're talking about cost. You know, squeeze more out of the worker, and I've been down learning curves too, and that's fine, but it's more than dry docks and cranes and worker productivity. We've got, as you've admitted, about half of the costs are outside of the shipyard; things we buy, the integrator software. I don't think we're focusing enough on those issues. There is just so much you can squeeze out of the laborer in the shipyard. Testing, for example; it goes on forever. It takes today, in a surface combatant, over a year to test the damn thing. Software, I understand the word on the street is that DDX is going to be built some piece of it in Bath and some pieces of it down in . I can't think of a better way to drive cost up and overrun the budget. So, I think there are a lot of things we need to focus on. Why are we having to do that like we're doing in Virginia? There may be good, Allison, good and sufficient reasons, and I've heard some of them, but these are the things that are killing us on cost, and we're not going to get cost down by just beating on the workers in the shipyards or occasionally putting in a bigger crane or a new dry dock. We've been pre-outfitting ships to seventy percent before we launch them for a decade or more. Well, that's not new. Come on. We need to look at more than just the shipyard; all the people, the second and third tier suppliers, the integrators, the software developers, the testers. That's where a lot of our costs are buried. I've said enough.

Moderator: Thank you sir.

Secretary Stiller: I agree with you. We are looking hard, and this isn't my area of expertise, but in the integrated warfare systems area, they are looking hard at – we're moving to open architecture, and we are also looking at how do we consolidate baselines of combat systems and

net down so that we don't have so many that we have to maintain and so much that it's really a maintain of the development area. So, that is being aggressively pursued within the Navy. On the two shipyards on DDX, right now, the plan – the Navy's strategy is the dual lead ships. While some components might be built – for example the deck house could be built in Gulf Port and could supply both yards. We're not adopting the Virginia model where certain modules of the ship, the boat, are always built in a certain yard. That's not the model for DDX at this point. Mike, did you want to add something?

Mr. Toner: Yes. Just a couple of things; we don't want ships at seventy percent, at least in the General Dynamics yards. We go in the water in the high eighties, and in the commercial world, into the nineties, and the plan is to minimize the amount of time the ship is in the water. That's an expensive time for the ship to be, and one of the last DDGs that we did, we had sixteen weeks from the time we put it in the water until we went to sea with it, which is a very good number. What we're trying to get out at NASCCO on the BP tanker is to reduce its time in the water from fifty – from thirty-seven weeks down to fourteen, and it looks like we're on track to go make that happen. There is cost associated with leaving a ship in the water. There is cost savings that can be given by driving the outfitting and the completion of the ships before you get the ship into – out of the – before you get the ship into the water and while you maximize the utilization while it's essentially in a shop floor condition. The vendor base and the other fifty percent of the cost certainly has to be worked, and I believe the Navy is working very hard on the GFE costs to take like savings out of it. It's not just on the back of a shipyard guy or some new crane or a dry dock that we are going to go put in place. We are going to make investments that allow us to go perform at a better rate and basically improve our performance financially out of those – out of that process, and so far, the investments that we have made across the GD shipyards have worked, for the most part. We haven't got all of the savings that we need to get out of NASCCO and out of BIW, but we're coming along the line.

I think the thing that you have to recognize and I want to talk about the submarine just for a second. We basically went to a multi-year contract on a submarine for the material costs, and we were able to take a significant amount of material off of that. Again, the team agreement that was put together in 1997 always envisioned us to get to two ships a year. It was put together at the of the government. It always said that we would get the two ships a year, and that has moved consistently over the last ten years. We always knew at the time that when you get to a half a ship a year you are really struggling from the standpoint of the volume in the small yard, and for that matter, a half a ship a year at Newport News maximizes the time the ship is in the period from pressure hull complete to delivery, which is an expensive period of time. You want to minimize that time, and that's where all the cost is. Part of the process; we got a multi-year for the vendors. We need, essentially, two ships a year to get the same level of efficiency that we can get out of the shipyard. It will allow us to go and maximize and support the infrastructure necessary to delivery a submarine to drive the cost down. A nuclear submarine going to sea has a very unique infrastructure; a hundred and fifty people plus are in harms way on the first day that ship goes to sea on its initial sea trials, and the protocol that you use to prepare a ship to go to sea is serious, significant, and requires rigorous engineering and diligence before you put people into that condition. That drives the cost, and that's going to be at the waterfront of either yard with a half a ship a year. It drives the cost. We need to get to two ships a year so that we

can start to take some of the efficiency and minimize the time that a ship is in the water and improve the time span from launch to delivery.

Moderator: Mr. Work.

Mr. Work: There are seven stakeholders in building the battle force and in preparing us for a competition against a potential naval challenger. Of course, there's the executive branch, there's Congress, there is the Office of Secretary Defense, Office of the Secretary of the Navy, the Navy and the Marine Corp both have a vote of course and then there's the industry. It seems to me, back to this question, that there's almost a proxy argument going on right now between the Department of the Navy and industry, but the real target is Congress. As I said last year when I was here, the tension between an efficient industrial base that builds ships for the absolute lowest cost, getting the two ships per year per shipyard, always bumps into the congressional responsibility to raise and maintain the Navy and to make sure that we have the industrial capacity necessary. So, for the first six frigates that we authorized in 1794, even back then, the efficient answer would have been to build all six frigates in one shipyard. We actually started six shipyards to build six ships. That is the congressional view, and it's not clear to me that going to the winner take all strategy, which we deferred to essentially by going to the two lead ship. We've set up the competition, but Congress will not vote in 2009 and say, "Hey. We're not going to go to one surface combatant yard." So, until we get all of these things settled out between Congress, industry, and the Department, we will not be able to drive the cost down as you have said to the absolute minimum that we can get to.

Moderator: Yes sir.

Question from Audience: Joe Martin, Mercer Management Consulting. Given what we all know about the aging workforce, what specific strategies do you have in mind or have actually employed to manage this as we go forward through this difficult period of changing the fleet over, recapitalizing? What sort of metrics are you looking at or would like to look at in that regard? And the question is to the panel in general.

Moderator: Very good.

Mr. Toner: That's a good question. I mean, that's one of your biggest concerns is what are you going to do with an aging workforce or a workforce that isn't as limber as it needs to be to do different things, going different places. At the end of the day, you have to somehow strike a balance, and it's easier said than done in that you, from our perspective, the apprentice program that's tied to both the designers and the constructors is absolutely critical that you have the capability of going forward with that, because you have to have some seed corn of young people coming into the process, and that may only be a few hundred people, but whatever it is, it's what you need to have to continue to grow and mature the workforce and keep the workforce from getting too far down the learning curve so that you get yourself into a position on the learning curve through the age curve. How do you say this politely? They'll end up like me; old and fat, and it's hard to do a lot of things when you're there. So, you've got to go work that issue, and that's a tremendous question.

I think the answer goes to having sufficient work that you can manage and it allows you to work on your apprentice program, both the design portion of the business and the construction portion, and when you're laying off, that's a hard thing to do, because unfortunately, by a lot of the regulations that we live under today and the union contracts and whatnot, the younger folks go out first. So, somehow you have to go work that, and there are a couple of ways that that can be done based on whatever agreements that you can make with your bargaining unit, but it's absolutely significant. At EB, we were fortunate enough to have, at the time we were reducing the numbers in the shipyard, that the design force was increasing, and we were able to take a number of workers from the work floor and put them onto the design floor, which was excellent, and we got a double bang for the buck. We had guys and gals that knew how to build ships also onto the design floor. We're going to be struggling with that now. Hopefully there's a way we can take out different occupational titles and you can reduce forces in different fashions and not necessarily all through seniority, but that's an issue that you have to work, and there's no one pill that you can take that satisfies everybody, but you have to go being very wary of it, and the issue that you watch is the age of your various crafts as they go down and what their capabilities are.

Secretary Stiller: A really great question; it goes right to the heart of competitive strategies. This is a problem that's faced across line. We have this huge talent pool based on the last really near-peer challenge competition we had, and they are all aging, and so, that's one of the things that concerns me about the dip in the Navy's plan where you really stop building a lot ships in the second decade of the twenty-first century for quite some time, and so, you can handle everything between now and 2011 essentially with the workforce that we have, but the question will be how do you bridge that decade to get to all of the building that you are going to require in the 2020s? So, it's a great question, and it's going to be something I know that is keeping a lot of people up at night.

Moderator: Yes sir.

Question from Audience: Hi. I'm Philip Shutler [sp], a retired Marine, and I noticed from Bob Work's diagrams and pictures of numbers that the fleet of ten years ago looks about like the fleet of today, and I'm sure that was intended by what he put up, but during the time of about fifteen years ago, when Bob was on active duty, they were doing a lot of work within the Navy and the Marine Corp in a series of white papers which were from the sea and for and from the sea, and the Marines continued that. , and Bob's comment that you've got to fight the war that you've got, which right now isn't a war with China. It's a literal war which the Navy has to move to being ashore in various places reflected now by the Riverine concept, which is really a good step, but from the time of fifteen years ago, the known weak point, the known long pole in that tent was the logistic movement that supported the activities that have to go on ashore, whether up rivers or across ports or into airfields, and the steps are not in the ships really but in the next step after the ship, which is how do you transport the stuff after that. It seems to me like we've gone to sleep for the last ten years at looking at that problem. The Marines continue to talk about Storm OMFDS [sp?], but they still don't have the logistic flow capacity on the transfer capacity from ship to craft or craft to plan or craft to aircraft that is needed, and so, the question is where is that fitting in or is it even appearing inside of the construction world and the design world of ships? Actually, if you look at the MPFS family of ships and the squadron concept that we've put together, it actually provides you – while the MPFS is designed to go after – to deliver two

bags worth of equipment initially, it also provides the capability, because you have selected offload, you have the ability to rapidly discharge onto craft through the mobile landing platform, and you are using T-AKES, which are in the CLF force now or getting ready to come into the CLF force. You have that resupply capability. You also have the large/medium speed roll on/roll off ships that the Army currently uses, and the Marine Corp has one within the MPFSE squadron. So, I think the resupply piece, while it wasn't attentive of how we came up with MPFS, I think you're going to see that it provides the ability to resupply in a very productive and efficient manner because of the ships that we chose to go into that family of ships.

Moderator: Mr. Work.

Mr. Work: In my judgment, this wasn't the topic of today, but the three hundred and thirteen ship Navy, in my judgment, is an unbalanced Navy for the very reason that General Shutler [sp] talked about. Decisions that we made in the early '90s assumed that we would have access. The 1993 said that really the defense problem was to stop two simultaneous cross-border invasions of armored heavy foes in distant theaters. So, the key thing was to try to deliver precision fires fast to do a rapid halt of the invasion, and then, we would build up the force. Starting in 1997, actually 1996 with the DSB strategic mobility study, they started to question that model and said, "Look, both operational and political access will be more problematic in the future, and you are going to have to increase the ability of the battle force to deliver ready-to-fight combat units. That's key, not doing the reception staging onboard and integration," and we have cut down the CLF to a very low level comparatively. The CLF being the combat logistic force ships. They have an extremely high operational rate in peace time, because they are manned by MSC crews, but we've added fifty-five LCSs that are extremely thirsty ships, and we only have two more tankers in the plan, and we've added upon that the requirement to provide fuel to Marines ashore. So, the CLF is definitely undersized in my estimation. The mobile logistics force; your tenders have been cut. We've given up on an ability to rearm our BLS cells at sea, and we are going to change LCS modules out in forward theaters. This fleet is far more reliant on forward access than at any time since about 1939, and I think there needs to be a lot more operational analysis breaking free from attacking North Korea or the typical MCOs that we plan and start to look at some of these other things.

Moderator: More questions? We have a few more minutes left. This is the time for you to bring out your really nasty questions. It's right at the tail end here.

Question from Audience: I'm not stepping up for that specific purpose, but I do have a question.

Moderator: There we are.

Question from Audience: Marty Bolinger [sp] with Booz Alan Hamilton. This is not the only sector of the defense infrastructure facing this problem. There is a problem on the government side. We have to deal with that in part. Sometimes, I wonder if we need to for industry for the same... [end of Tape 1 Side 2].

Is there any scenario in shipbuilding that could lead to a similar outcome?

Mr. Toner: Well, as always Marty, you always ask tough questions. Marty was with us way back when when we started doing the right sizing activities at Electric Boat in the '90s. I think we're there right now. I don't know – I presume to speak for the government, but I think Congress has dictated where the shipbuilding is going to be at. I don't see any further right sizing than the other two. I think that there are opportunities within each of the companies to do sharing across the lines of the shipyards, and we're doing it at GD, and I'm sure the folks at Northrop are going to be doing it also relative to the engineering support and the manufacturing support where you have that ability to do that based on your relationships with your bargaining units. So, I don't see that happening any further, but that's just a guy that builds ships. I don't really know.

Secretary Stiller: I tend to agree with Mike. I don't see any further consolidation beyond where we are right now in the shipbuilding, and I'll be honest. I'm not familiar with this space, but I'll look into it.

Moderator: Well, there are lots of opinions and divergent views in this room about shipbuilding, but I think one thing we can all agree on is that our panelists have done a terrific job. Let's give them a great hand. Many thanks to Allison Stiller, Michael Toner, and Robert Work, and as a small token of our appreciation, we're going to present them with a new book recently published by the Navy League, *The Navy League of the United States – Civilians Supporting the Sea Services for More than a Century*. Thank you. All three of you, thank you very, very much. We appreciate it. Thank you.